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




























Categories: AIR / Bombs / Atomic bombs and charges / RDS-4 Tatyana (1953) /

RDS-4M
★★★★

In sources, there is an identification of RDS-4 as "product 244N", which is an erroneous identification.



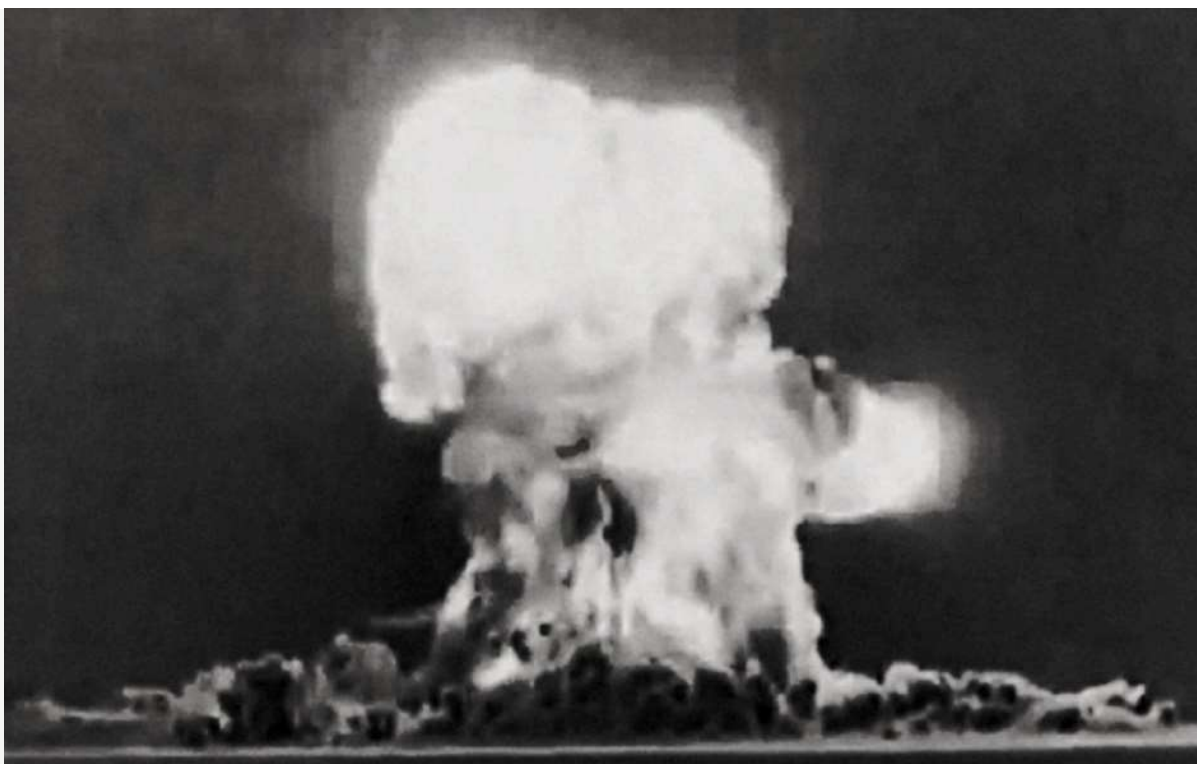
RDS-4 bomb in the museum (Sarov, <http://www.vniief.ru/>).

-  AIR
 -  Bomber
 -  Fighters
 -  Transpo
 -  Special
 -  Helicop
 -  UAV
 -  Air-to-air
 -  Air-to-ground
 -  Aircraft
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RDS-4 Tatiana
ordinary explosion
ordinary is it?!
whole new...
Sierra 2019-10-

DISCUSSION



Explosion of the RDS-4 bomb at the Semipalatinsk test site on August 23, 1953 (VNIIEF)

*Генерал
Дружинин
14/8/53*

Передано по ВЧ

Сов. Секретно
/Особая папка/

В ПРЕЗИДИУМ ЦК КПСС

товарищу МАЛЕНКОВУ Г.М.

Докладываем, что задание Коммунистической Партии и Советского Правительства о создании Атомной бомбы малых габаритов и веса большой разрушительной силы - выполнено.

23 августа 1953 года в 5 часов по московскому времени сброшена с самолета ИЛ-28 с высоты 11000 м. и взрыва на высоте 600 м. от земли Атомная бомба РДС-4.

Вес этой Атомной бомбы РДС-4 1300 кг. наружный диаметр - 820 мм. и длина 3340 мм.

Взрыв сопровождался образованием огромного и грибовидного облака, которое поднялось на высоту примерно 13 км.

Взрыв бомбы был хорошо виден в поселке полигона на расстоянии 61 км и в городе Семипалатинске на расстоянии 120 км от места взрыва.

После взрыва бомбы на опытном поле полигона трава была сожжена полностью в радиусе до 1,5 км., а местами на больших расстояниях от места взрыва.

Расставленные на опытном поле грузовые и легковые автомобили получили повреждения и загорались на дистанции свыше 4 км. Загорались также жилая землянка воинской части, находившаяся на расстоянии 3,5 км от места взрыва.

АРХИВ ПРЕЗИДЕНТА
РОССИЙСКОЙ ФЕДЕРАЦИИ
Фонд № 3 Опись № 44
Дело № 50 л. № 148

2.

Самолеты получили сильные разрушения на расстоянии до 1,5 км от места взрыва и в радиусе до 4 км разрушения требующие ремонта.

Зажигательное действие этой бомбы было большим чем во всех предыдущих опытах и объясняется тем, что бомба РС-4 была взорвана на высоте 600 вместо заданных 400 м.

Почва в районе взрыва во многих местах вспучена в радиусе до 600 м от центра взрыва.

В связи с тем, что бомба была сброшена и взорвалась с отклонением от центра прицельного круга на 390 метров и на высоте 600 метров бронетанковому и артиллерийскому вооружению, оказавшемуся на большем удалении от места взрыва, чем предполагалось, особых повреждений не причинено.

На опытном поле было размещено 150 подопытных животных.

Животные стоявшие открыто на поле были убиты в радиусе до 250 м. и получили сильные ожоги в радиусе до 3200 м от места взрыва.

По предварительным подсчетам ученых, проведенным по показаниям приборов и индикаторов, а также по разрушениям сооружений и поражениям животных на опытном поле мощность бомбы РС-4 по полному траттлсвалу эквиваленту оказалась не менее 25.000 тонн, вместо ожидавшихся по расчету 21.000 тонн.

В.Малышев
А.Василевский
А.Завенягин
М.Хруничев
И.Курчатов
С.Руденко
В.Харитон

Исх 1507/1
24. VIII 53.
24 августа 1953 года
Передал - Сумин
Принял - Кузнецов *В.Курчатов*

АКТИВ ПРЕЗИДЕНТА
РОССИЙСКОЙ ФЕДЕРАЦИИ
Фонд № 3 Опись № 47
Дело № 50 л. № 149

Report on the testing of the RDS-4 bomb (August 24, 1953, archive of the President of the Russian Federation)

In 1953-1954, work was carried out to modify the RDS-4 charge to reduce the mass of the acutely scarce plutonium and uranium-235 (due to a shortage of fissile materials). Thus, a letter dated August 18, 1953 proposed serial production of RDS-4 bombs in 1954 without the addition of uranium-235 with a reduction in the planned yield from 25 to 20 kt. Also in 1954, it was planned to begin testing the external "pulse neutron source" (INI) and it was planned to test the RDS-4 with the DAR (Long-Range Atomic Rocket, R-5M). The development and use of a nuclear charge, initiation system and sensors in the DAR missile was specified by KB-11 by the Resolution of the USSR Council of Ministers No. 2962-127ss of 17.12.1953.

The obtained research results laid the foundation for further development and optimization of the plutonium mass and energy release of the charge based on the implosion principle. A version of the RDS-4 charge, designated RDS-4M, was developed. It contained a smaller amount of fissile materials and, accordingly, had a lower power. In the RDS-4 bomb format, reduced-power munitions with small plutonium masses were created with charges that were tested in four batches at the Semipalatinsk test site in the fall of 1954 (four explosions from September 29, 1954 to October 5, 1954 with a yield of 0.03 kt to 4 kt, three with an air explosion at an altitude of 200-300 m, and one with a contact ground explosion). The last test allowed the operation of the contact automation to be checked and the contamination of the area to be assessed.

In addition to the RDS-4M bomb, a modification of the R-5M ballistic missile warhead was developed, as well as a warhead for the KS-7 (FKR-1) frontline cruise missile on a mobile launcher ([source](#)). The RDS-4M charge was also used in the R-11M operational missile launcher and the R-11FM naval missile.

In 1954, the RDS-4 bomb and charge were accepted into service and became **the first serial atomic bomb** ([source](#)). Since 1953, serial production of the RDS-4 was conducted at Plant No. 551 (now EMZ "Avangard") in Arzamas-16 and at the Instrument-making Plant in Zlatoust-20 (Trehgornyy). The first two serial RDS-4 bombs were produced by the Trehgornyy plant in August 1955. Since the beginning of 1956, the plant switched to the production of a modernized bomb with a RDS-4M charge ([source](#) - [Zavalishin](#)). The bomb was produced at least until the mid-1960s - in 1965, a slightly modernized version of the bomb went into production (on display in the museum of the Instrument-making Plant, Trehgornyy, [source](#)).

On January 20, 1955, the Minister of Medium Machine Building V.A. Malyshev sent a plan for experimental design work to KB-11, which, in particular, provided for:

3. Completion of the development of the warhead of the DAR missile ("Long-Range Atomic Rocket" / R-5M) with an RDS-4 type nuclear charge;
7. Development of a warhead with an RDS-4 type nuclear charge for the KS-7 (FKR-1) aircraft missile;
10. Development of a warhead with a nuclear charge of the RDS-4 type for the R-11 missile.

Later, the RDS-4 nuclear charge was used as the first stage of the RDS-37 thermonuclear charge.



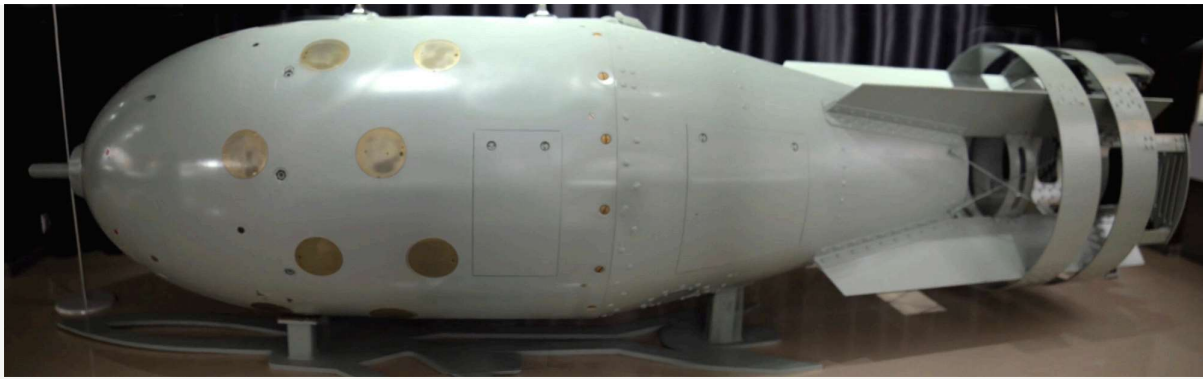
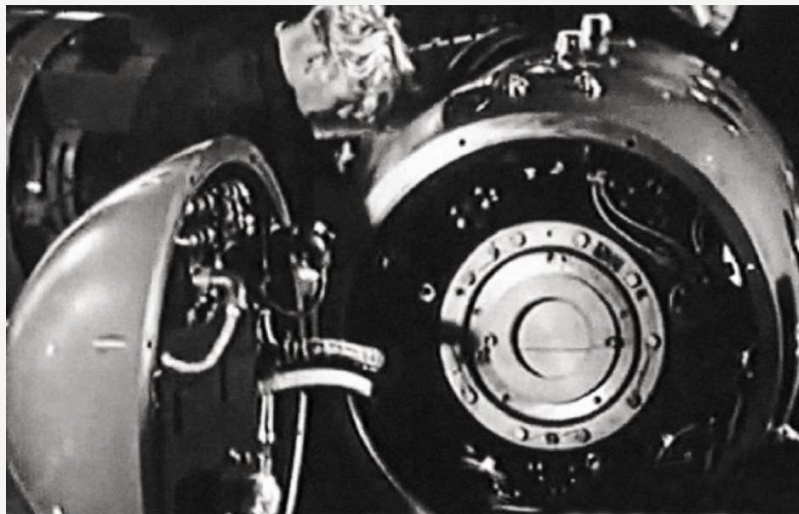
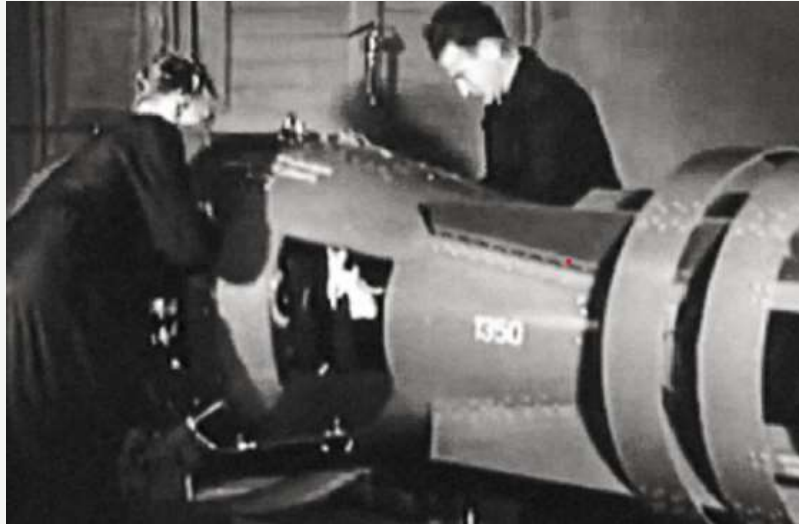
Model of the RDS-4 bomb, model 1965, at the 61st anniversary of the launch of serial production at the Instrument-making Plant in Trekhgornyy (<https://www.atomic-energy.ru/>).

Design - the Tatyana aviation bomb with the RDS-4 charge is based on the FAB-1500 M-46 form factor bomb with a design change. Windows for installing the implosion charge fuses are visible in the body.





The RDS-4 atomic bomb of the 1953 design (one of two surviving ballistic bomb bodies) from a monument in the town of Bor near Nizhny Novgorod, 2016 (photo - Dmitry Kashkanov, [source](#)).

The RDS-4 atomic bomb (<https://museum12gu.mil.ru/>)

Assembly of the RDS-4 bomb (VNIIEF)

RDS-4 bomb performance characteristics :

Bomb diameter - 820 mm

Weight:

- 1200 kg (most sources, full weight of the bomb)
- 2200 kg (weight of the loaded bomb according to the 2014 monument. [source](#) , presumably - error)
- 1000 kg (weight of the bomb structure according to the 2014 monument. [source](#) , presumably - error)

Power:

- 25 kt (planned power, 1953)
- 28 kt (during the test explosion on 23.08.1953)
- 30 kt (standard)

Charge type - an atomic charge made according to the classical implosion scheme with a reduced amount of working substance. The design of the fissile core and neutron fuse was similar to that used in the RDS-2 product. The outer diameter of the charge was reduced by 1.5 times compared to the RDS-1, RDS-2 and RDS-3 charges. The implosion system used the same explosive as the RDS-1 and RDS-2 charges (a mixture of TNT and hexogen in a 1:1 ratio - TG 50/50). For better synchronization of the implosion and neutron initiation processes, work began in KB-11 in 1948 to create a more effective neutron source located outside the nuclear charge - having passed through the creation of the INI ("pulse neutron source"), the topic later probably developed into the R&D "Gudron".

The working substance is plutonium (Pu-239).

The neutron source in the core is polonium-beryllium, located in the center of the spherical charge.

The diameter of the charge is 820 mm .

Modifications:

- **RDS-4** - the main modification of the bomb and charge.



Model of the RDS-4 bomb at the exhibition dedicated to the 75th anniversary of the 12th Main Directorate of the Ministry of Defense of the Russian Federation in the Patriot Exhibition Center, 2022 (<http://www.patriot-expo.ru/>)

- **RDS-4 model 1965** - serial version of the bomb produced by the Instrument-making plant (Trekhgornyy). The design of the stabilizers has been changed. There are probably changes in the electrical system of the ammunition. It is possible that the RDS-4M charge is used (see below).



A sample of the RDS-4 model from 1965 in the museum of the Instrument-making plant, Trekhgornyy (<https://karopka.ru/>).

- **RDS-4M** - a version of the charge with a reduced amount of fissile materials - with a minimum plutonium charge, initially with a capacity of up to 4 kt. Work on the RDS-4M product began in KB-11 as early as 1950 - included in the work plan and the product is mentioned in documents. The first test was on September 29, 1954 (Semipalatinsk test site). In 1953-1954, research was conducted at test site tests related to reducing the mass of acutely scarce plutonium required to create the charge (due to a shortage of fissile materials). The results obtained laid the foundation for further development and optimization of the plutonium mass and energy release of the charge based on the implosion principle. The RDS-4 charge contained a smaller amount of fissile materials and, accordingly, had a lower power. In addition to the bomb with the RDS-4M charge, a modification of the warhead of the R-5M ballistic missile was developed, as well as a warhead of the KS-7 / FKR-1 frontline cruise missile on a mobile launcher ([source](#)). Serial production of bombs with the RDS-4M charge was carried out by the Instrument-Making Plant in Trekhgornyy from the beginning of 1956 instead of bombs with the RDS-4 charge.

- **RDS-4M U235 (uranium-235)** is a conditional name - by 1957, a large amount of uranium-235 had been produced at the enterprises of the USSR Ministry of Medium Machine Building and it became possible to create an implosion-type charge using only uranium-235 (without plutonium-239) as fissile materials.

The charge was developed by KB-11 and successfully tested in September 1957, after which it was used in warheads of nuclear weapons (*source - Greshilov*). The charge was used in the R-11M operational-tactical missile, the R-11FM naval missile, and the Filin tactical missile.

Carriers:

- Il-28 - bomber, carrier of aviation bombs with the RDS-4 charge.
- Tu-16 - bomber, carrier of aviation bombs with the RDS-4 charge.
- Tu-95 / M-4 - heavy bombers, carriers of aviation bombs with the RDS-4 charge.



The warhead of the R-5M missile with the RDS-4 nuclear charge, VNIIEF museum ([source](#)).

Application of RDS-4 charge in bombs and rockets :

Carrier	Ammunition	Charge
RDS-4 aerial bomb	The RDS-4 bomb was tested with an explosion on August 23, 1953.	RDS-4
RDS-4M aerial bomb	The RDS-4M bomb was tested by explosion on September 29, 1954.	RDS-4M
KS-1 air-to-ground cruise missile	For the VNIIA missile, a nuclear warhead with an RDS-4 charge was developed. The automatic control devices of the nuclear warhead were combined into a special block of on-board equipment. The safety stages of the FBP and the trajectory measurement sensors were made by VNIIA based on its own developments. Several response modes were implemented: remote on command from the missile's radar homing head and contact. The nuclear warhead with automatic control was placed in the missile's combat charging compartment, and the contact sensors were in the warhead and in the wings. The flight altitude was determined by a barometric sensor. The total mass of the nuclear warhead and automatic control was 600 kg.	RDS-4
FKR-1/KS-7 surface-to-surface cruise missile	Nuclear warhead developed by VNIIA using the experience of creating nuclear warheads for the KS-1 missile. In 1957, the missile passed flight tests. RDS-4 type charge (believed to be RDS-4M)	RDS-4M
2K1 "Mars"	Missile 3R1 - warhead development was carried out in 1955-1957 by KB-25 MSM (now - VNIIA named after N.L. Dukhov) with RDS-4 charge.	RDS-4
2K4 "Filin"	The 3R2 missile is an above-caliber warhead developed by NII-1 with an RDS-4 charge. The 3R4 missile is an above-caliber warhead from the Mars complex missile developed by VNIIA with an RDS-4 charge.	RDS-4M U235
R-11M operational-tactical missile	YABP/BC 3N10 with a charge of the RDS-4 type with a yield of about 10 kt. Developed in 1954-1958. The missile with the warhead was accepted into service in April 1958. The ammunition was developed by KB-25 MSM (VNIIA named after N.L. Dukhov)	RDS-4M U235
R-5M / DAR long-range missile	The development and use of a nuclear charge, initiation system and sensors in the DAR missile was specified by KB-11 by the Resolution of the USSR Council of Ministers No. 2962-127ss of 17.12.1953. Option 1 - warhead with RDS-4 charge Option 2 - warhead with RDS-4M charge The missile was withdrawn from service from 1964 to 1968.	RDS-4 RDS-4M

R-11FM sea-based ballistic missile	3N10/17A2 nuclear warhead with RDS-4 type charge (believed to be RDS-4M) developed by VNIIA	RDS-4M U235
X-20 air-to-ground cruise missile	<p>In 1954, VNIIA, under the direction of N. L. Dukhov, began developing a nuclear warhead for the Kh-20 missile with an RDS-4 charge; the charge entered state testing in 1958. The automation probably used barometric altimeters and units similar to the automation of the RDS-4 aerial bomb. During testing, the RDS-4 charge was replaced with a charge developed by NII-1011. The Tu-95K complex was accepted into service with the Air Force in 1960.</p> <p>The Kh-20M missile used a nuclear munition with a different charge developed by KB-11 and new automation. The modernized Tu-95KM complex was accepted into service with the Air Force in 1962.</p>	RDS-4
2K6 "Luna"	The 3N14 over-caliber warhead with a 901A4 charge with a yield of 10 kt, developed by KB-11 (VNIIEF, Sarov / Arzamas-16, under the supervision of S.G. Kocharyants). The warhead was created by the decree of the USSR Council of Ministers dated March 20, 1958. The warhead was removed from service in 1967.	901A4 type RDS-4
R-17/8K14 operational-tactical missile	GC - 8F14 body, warhead "269A" / article 69 with a charge of the RDS-4 type (developed in 1959-1962) with a yield of 10 kt. The warhead was developed by KB-11 MSM (now VNIIEF), chief designer - S.G. Kocharyants, scientific director - Yu.B. Khariton. The warhead was accepted into service as part of the R-17 missile in 1964.	type RDS-4
FKR-2/S-5 surface-to-surface cruise missile	3N23	type RDS-4

Status : USSR

- August 23, 1953 - a successful test of the RDS-4 bomb with an Il-28 carrier aircraft was conducted at the Semipalatinsk test site. Dropped from an altitude of 11,000 m, the bomb exploded at an altitude of 600 m. The power of the explosion was 28 kt.

- September 29, 1954 - a test of a bomb with a reduced charge RDS-4M at the Semipalatinsk test site

. - October 1, 3 and 5, October 3, 1954 - continued testing of the RDS-4M bomb at the Semipalatinsk test site. Maximum explosion power - 4 kt.

- February 2, 1956 - Operation Baikal, the first launch of the R-5M missile with a RDS-4 warhead and the fifth launch of the state test program of the R-5M missile. The launch was carried out from the Kapustin Yar test site at a target at a test site in the Aral Karakum Desert (the city of Aralsk). The preparation and implementation of Operation Baikal, carried out at the insistence of the Minister of Defense, Marshal of the Soviet Union Georgy Zhukov, was supervised by a specially created commission chaired by Pavel Mikhailovich Zernov, which included representatives of OKB-1, KB-11 and the Ministry of Defense. On February 2, 1956, at 10:30 Moscow time, the missile was launched from the Kapustin Yar test site (Astrakhan Region) and less than eleven minutes later, having covered a distance of 1,190 km, reached the designated square in the deserted sands of the Aral Karakum Desert (150 km northeast of the Aral Sea). After the fuse was triggered, a nuclear explosion of artificially reduced power (up to 0.3-0.4 kt) occurred - the first in the history of the nuclear missile era ([source](#)).

- 1992 - from May to August 1992, a specially created commission of specialists from VNIIEF, VNIITF and the Ministry of Atomic Energy of the Russian Federation worked. A decision was made to demonstrate the first seven exhibits of the future museum. These are the first atomic bomb RDS-1, the first serial bomb RDS-4, the first hydrogen bomb RDS-6, the warhead of the tactical missile system "Luna", the warhead of the multiple warhead of the R-36M missile, the warhead of the R-7 missile and the most powerful hydrogen bomb in the world ([source](#)).

- 2014 - in August 2014, a monument with the RDS-4 bomb was erected in the town of Bor near Nizhny Novgorod as an addition to the monument to the nuclear designer Yevgeny Negin, who was born in Bor ([source](#)).



Monument with RDS-4 bomb in the town of Bor near Nizhny Novgorod (2014, [source](#)).

Sources :

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